

AMENDMENTS TO THE DRAWINGS

Please replace the formal drawing sheet 8 containing Figure 9 previously submitted with the replacement sheet 8 submitted herewith.

Please replace the formal drawing sheets 10-15, 17 and 18 previously submitted with the replacement sheets 10-15, 17 and 18 respectively submitted herewith.

Figure 9 on replacement sheet 8 has been relabeled so that the circuit on the left is now Figure 9A, and the circuit on the right is now Figure 9B. In addition, Figure 9B has been amended to add Label K1 to refer to the single magnetic pickup. Figure 9B has also been amended to include the label “Prior Art” to describe the circuit. The “conventional multi-pole circuit” shown is described in the specification on page 18, lines 4-6, which has been amended to change label “K” to “K1” to avoid confusion with Label K in Figure 15. The specification has been amended to replace Figure 9 with Figure 9A and/or Figure 9B as necessary.

Figure 11 on replacement sheet 10 has been amended to change “A” to “A1.” The specification has been amended accordingly.

Figure 12 on replacement sheet 11 has been amended to change “A” to “A2.” The specification has been amended accordingly.

Figure 13 on replacement sheet 12 has been amended to change “A” to “A3”; “B” to “B3”; and “C” to “C3.” The specification has been amended accordingly.

Figure 14 on replacement sheet 13 has been amended to change “A” to “A4”; and “B” to “B4.” The specification has been amended accordingly.

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Figure 15 on replacement sheet 14 has been amended to change "A" to "A5"; "B" to "B5"; and "C" to "C5." The specification has been amended accordingly.

Figure 16 on replacement sheet 15 has been amended to change "A" to "A6"; and "B" to "B6," The specification has been amended accordingly.

Figure 18 on replacement sheet 17 has been amended to change "A" to "A7"; "B" to "B7." The specification has been amended accordingly.

Figure 19 on replacement sheet 18 has been amended to change "A" to "A8"; and "B" to "B8." The specification has been amended accordingly.

The drawings have been amended in accordance with 37 CFR 1.121(d). No new matter has been introduced to the specification by the amendments to the figures, support for which can be found in the specification as discussed in the Remarks section of this paper.

REMARKS

Applicant has carefully considered the Office Action mailed November 9, 2005 and the references cited therein. Accordingly, Claims 6, 15 and 20 have been cancelled, new Claim 21 has been added, and Claims 1-5, 7-14, and 16-19 have been amended in a sincere effort to clarify the subject matter Applicant regards as the invention.

To address objections to the drawings, Replacement Sheets 8, 10-15, 17 and 18 are submitted herewith to replace Original Sheets 8, 10-15, 17 and 18, respectively, as described in "Amendments to the Drawings." In addition, amendments to the specification are submitted to correct typographical errors in references to the drawings as described below.

Support for this Amendment is generally found within the specification, claims, and drawings, as originally filed. As a result of this Amendment together with the Remarks set forth below, it is respectfully submitted that Claims 1-5, 7-14, 16-19, and 21 are in favorable condition for allowance.

Applicant thanks the Examiner for the telephonic interview conducted on May 4, 2006 with the undersigned attorney for the Applicant. The discussion related to Figure 9, and to distinguishable features of the present invention over commonly owned international publication WO 01/95052 to Barry. Applicant has split Figure 9 into two figures, Figure 9A and Figure 9B and clearly labeled Figure 9B as prior art, as suggested by the Examiner.

In addition, the attorney for the Applicant pointed out particular passages of the *Barry* publication that clearly describe a single transducer coupled to a series of strings. In addition, several passages in the present specification were recited to the Examiner that clearly describe a plurality of uncoupled, isolated transducers, wherein each transducer is associated with a single string. Applicant's comments and amendment to Claim 1 were well-received by the Examiner. The Examiner indicated that a favorable outcome would depend upon the results of an additional search for prior art. It is Applicant's understanding that the

additional search is required as a result of the amendment to Claim 1. The amendments were made to clarify that which the Applicant regards as the subject matter of their invention.

Objections to the Claims and Rejections Under 35 USC 112

In the Office Action, Claim 15 is objected to under 37 C.F.R. 1.75(c) as failing to further limit the subject matter of the claim from which it depends. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being an indefinite omnibus type claim. Claims 15 and 20 are cancelled in this amendment. Therefore, the objection to Claim 15 and rejection of Claim 20 under 35 U.S.C. 112 are moot.

Claim Rejections Under 35 U.S.C. §102

Claims 1, 2, 4-6, 10-14, and 16-19 are rejected under 35 U.S.C. §102(b) as being anticipated by international patent publication WO 01/95952, referred to herein as the *Barry* publication.

The present invention is directed to an interactive multimedia apparatus which includes a digital musical instrument having a plurality of control members including at least one limited state (ON/OFF) control member and at least one dynamic range state control member. A state of each control member is selectable by the user. The apparatus also includes a central control unit with a store of digital media, such as digital audio files corresponding to recorded notes of different instruments, and a suite of software. The software allows a user to assign one of the digital audio files to a limited state control member. The software also interprets the state of the control members, so that upon a user activating the limited control member by switching to the “ON” state, the file assigned to the control member is selected, opened and rendered. The software additionally allows assignment of a musical note to each user-activated source of a musical note, e.g., a guitar string, in accordance with the selected digital audio file (see Claim 1; and, e.g., p. 22, ll. 22-32 through p. 23, ll. 1-5).

A control unit is associated with the digital musical instrument and is adapted to communicate with the central control unit. The control unit includes a CPU for identifying and monitoring a user-selected state of the control members, which is then communicated to

the control unit. The control unit also includes a plurality of independent, uncoupled transducers. Each transducer is associated with and configured to monitor one user-activated source of a musical note, for example, a string on a guitar, (Claims 4-5, e.g.) and to convert activation (strumming, or plucking) of the one user-activated source into electrical signals associated with the note assigned to that string in accordance with the user-selected state of the control members. The transducers are isolated, independent transducers, and may include one of a variety of available transducers capable of individual pickup, such as piezo-electric type transducers (Claims 2-3).

In operation, a user assigns a chord played by a guitar, for example, from the store of digital media to one of the limited state control members, and stores it in central control unit memory (Claim 12). Once the chord is assigned, the user may access the memory to select the chord by activating the corresponding control member. For example, if a chord (C Major, e.g.) is selected from the store to correspond to a push-button (limited state control member) located on a guitar, and the user has selected the chord by depressing the push-button, then the appropriate notes (C, E, and G) are assigned to the three appropriate strings by the control unit. Strumming or plucking (activation) of one of the assigned strings will trigger the transducer associated with that string to convert mechanical movement (including amplitude and duration of vibration) into electrical signals which are processed to produce audio output associated with the assigned note. And, of course, plucking all of the strings will produce the entire chord. Special effects may also be assigned to other dynamic range state members and activated by the user while playing. See, e.g., Claims 7-12; and p. 21, ll. 27-31; p. 23, line 30 to p. 24, line 3; p. 22, ll. 19 to 31.

Accordingly, the invention eliminates the complexity of fret fingering. In addition, unused strings of a chord may be assigned a note which is complementary to or included in the chord. Additional user-selectable effects can be assigned to switches, buttons, or pedals using the software suite, which are activated by the user to dynamically alter the audio output.

In addition, the present invention may include a series of light emitting diodes (LEDs), one under each string, near the neck. The lights are activated under the strings required to compose the selected chord, so that the user will be notified of the correct strings

to strum, or individually pick (Claim 14; see also, e.g., p. 19, ll. 1-6; p. 21, ll. 9-17).

Accordingly, the present invention provides, for example, an interactive multimedia apparatus that assists users in developing knowledge of chord structure, complex chord structures, scales, and fingering of notes on the fret of stringed instruments.

The invention particularly relies on independent pickups provided for each string. See, in particular, p. 21, ll. 28-31; p. 18, ll. 4-9. A plurality of individual, coupled, isolated transducers are used, so that each transducer can only be energized by activating the particular string associated with such transducer. This allows much greater control and flexibility to the user in performing and composing music, compared to the prior-art multipole transducer which is energized to produce a single output signal when any one or a combination of strings are activated.

In contrast to the present invention, the *Barry* publication relates to an interactive multimedia apparatus with a music simulation instrument having activation means that simplifies the use of the system by an “air-guitarist.” The apparatus includes a control unit, storage means for storing simulation tracks and audio/visual means for playing a main track. The control unit includes software for receiving and analyzing the electrical signals generated by the music simulation instrument and a means for synchronizing the simulation track with the main track (Claim 1, the *Barry* publication). Claim 14 further recites that the “activation means operable by the user comprise a series of strings and a transducer to convert the strumming of the strings into electrical signals.” In particular, the apparatus allows an operator to select a chord and play it by strumming any or all strings, which are “solely used as a triggering mechanism”(see p. 9, ll. 17-24). Accordingly, a single transducer is used to pickup any or all string vibration, so that “the activation means ...comprise a series of strings and a transducer to convert the strumming of the strings into electrical signals.” (See p. 6, ll. 9-11). Therefore, the interactive multimedia apparatus of the *Barry* publication does not allow a single note of an assigned chord to be played by plucking a single string, and only that string, to which the note is assigned. Instead, all of the strings are coupled to the same transducer. Activating any one string in the *Barry* publication, generally by strumming, plays whatever chord is assigned (p. 9, ll. 6-10).

The *Barry* publication does *not* teach or suggest “a series of transducers” as stated on p. 7, Item 20, of the Office Action or a plurality of “transducers monitoring the individual strings” as stated in Item 24, p. 7 of the Office Action. In particular, the transducer of the *Barry* publication is not an uncoupled, independent transducer configured to monitor one user-activated source of a musical note, e.g., a string. Instead, the single transducer in the *Barry* publication uses a single magnetic pickup which is *coupled to all of the strings* (see, e.g., pp. 14, ll. 26-30 through pp. 15, ll. 1-6) in order to associate any and all of the strings energized with the same digital file.

In addition, the *Barry* publication does not disclose or suggest the interactive multimedia apparatus of the present invention that further includes indicators on the digital musical instrument that are controllable by the central control unit in response to an assignment of digital media against specific control members by a user, and which show the user which dynamic range state control members have been assigned to produce audio/visual output if activated, as recited in Claim 13-14. Contrary to the assertion in Item 28 of the Office Action, only a power-indicating LED 47 is provided on the digital instrument of the *Barry* publication. This LED does not show *assignment of dynamic range state control members*.

Accordingly, the *Barry* publication also does not teach the limitation of amended Claim 14, which includes a plurality of light emitting diodes (LED), each LED being proximate to one of the at least one user-activated source of a musical note, e.g., strings. When the assigned file is a musical chord associated with a number of the strings, for example, the LEDs associated with the strings representing the chord are energized in response to a user selecting the assigned file.

In summary, the *Barry* publication does not teach or suggest the interactive multimedia apparatus as claimed in the present invention, which includes a plurality of independent, uncoupled transducers, each of which is associated with a different string to convert activation (strumming, or plucking) of the one user-activated source (string) into electrical signals associated with the user-selected state of the control members. Therefore, Applicant submits that the present invention is patentable over the *Barry* publication. In particular, in view of the amendments and remarks provided herein, Applicant respectfully

submits that Claim 1 is patentable under 35 U.S.C. 102. In addition, at least by virtue of the dependency of Claims 2-5, 7-14, and 16-21 from Claim 1, and further in light of the remarks provided above, Applicant respectfully submits that all pending Claims 1-5, 7-14, and 16-21 are patentable under 35 U.S.C. 102. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. 102 are respectfully and earnestly solicited.

Claim Rejections Under 35 U.S.C. 103

Claim 3 is rejected under 35 U.S.C.103(a) as being unpatentable over the *Barry* publication in view of U.S. Patent No. 5,455,3381 to Juskiewicz, et al. Claims 7-9 are rejected under 35 U.S.C.103(a) as being unpatentable over the *Barry* publication in view of U.S. Patent No. 2,986,953 to De Armond, et al.

The *Juskiewicz* patent relates to an apparatus and tool for adjusting the output of individual strings of a stringed instrument using electrical pickup, which may be provided by piezoelectric transducers. The *De Armond* patent relates to a dual operational foot pedal adaptable to adjust and regulate controls such as volume and tone.

Neither the *Juskiewicz* patent nor the *De Armond* patent corrects the deficiencies of the *Barry* publication. Neither patent teaches or suggests an interactive multimedia apparatus with a control unit associated with the digital musical instrument which includes a plurality of independent, uncoupled transducers. In particular, neither patent teaches a plurality of transducers, each of which is used to independently activate an electrical signal which is associated with one guitar string, for example, which is assigned a note in accordance with a user-selected digital audio file and the user-selected state of the control members.

Because the *Barry* publication does not teach or suggest the use of multiple, isolated, independent transducers, there is no motivation to combine the *Juskiewicz* patent with the *Barry* publication. In addition, neither the *Barry* publication, nor the *Juskiewicz* patent, nor the *De Armond* patent either alone or in combination teaches or suggests a central control unit with a suite of software for assigning a musical note to a user-activated source (e.g., a string) in accordance with an assigned digital audio file, which is selectable by a user by activating the ON state of the corresponding limited state control member, where one of a plurality of

independent, uncoupled transducers monitors the one string and converts activation of the one string into electrical signals associated with the assigned musical note.

Therefore, Applicant respectfully submits that Claim 3 is patentable over the *Barry* publication in view of the *Juskiewicz, et al.* patent, and Claims 7-9 are patentable over the *Barry* publication in view of the *De Armond, et al.* patent. Accordingly, reconsideration and withdrawal of the rejection of Claims 3 and 7-9 under 35 U.S.C. 103 are respectfully and earnestly solicited.

Objections to the Drawings

The drawings are objected to for inconsistencies noted between the specification and the drawings. In addition, the drawings are objected to as failing to comply with 37 C.F.R. 1.84(p) for containing reference characters not described in the specification (Figure 15) or omitting characters described in the specification (Figure 9B). In addition, the Office Action states that the same reference characters "Label A, B and C" have been used to designate different menu options in Figures 10 to 19.

The objections to the drawings have been addressed by amending one or both of the drawings and specification to address each itemized objection listed on pages 2-5 of the Office Action as follows. As to Item 1, the number of 4700 ohm (4k7) resistors listed on page 15 of the specification has been corrected by amending page 15 to properly recite thirteen 4k7 resistors. In reference to Item 2, page 16 has been amended to include "U3" as referencing TS931 ILT, consistent with Figure 9B and page 14, lines 30-32.

The listing of five transducers on page 16 of the specification is objected to in Item 3. Page 16 has been amended to include the reference numeral 50 to refer to the transducers, as described, for example, on page 10, lines 28-32, and as shown in Figures 4 and 5. On page 11, lines 12-16, the specification teaches that each string is associated with its own transducer, which converts the mechanical vibrations to an electrical signal. The electrical signal is then forwarded to a USB interface unit.

To address Item 6, the specification has been amended on page 18 to reference the jack sockets J1 and J2 shown in Figure 9A. The Examiner notes in Item 7 that character D

from Figure 15 is not mentioned. Accordingly, Applicant has amended the specification to correct typographical errors on page 24, including changing "Figure 15 Label B" to "Figure 15 Label D" at line 15.

Previous Figure 9 has been split into Figure 9A and Figure 9B as suggested by the Examiner during the telephonic interview. Figure 9B was amended in Replacement Sheet 8 submitted herewith to include a Label K1, which was mistakenly omitted from the figure to address the objection stated in Item 10. The Label "Prior Art" has also been added, as discussed with, and agreed upon by the Examiner during the telephonic interview. As discussed, support for the addition of Label K1 and the prior art label is found at least on page 18, lines 4-9, and also in the priority document IE S2002/0580, Figure 13(ii) and associated text. Replacement Sheets 10-15, 17 and 18 are also submitted herewith, as described in the Amendments to the Drawings, and amendments to the specification have been made, as provided in the Amendments to the Specification, to re-label "A," "B," and "C" in Figures 11-19 in response to Item 12.

Applicant respectfully submits that the drawings are now in compliance with 37 CFR 1.84(p)(4) and (5). Accordingly, Applicant respectfully submits that the objections to the drawings have been obviated.

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CONCLUSION

In view of the above remarks, Applicant submits that the Application and claims as amended are now in condition for allowance. Accordingly, Applicant respectfully and earnestly solicits favorable consideration and allowance of pending Claims 1-5, 7-14, 16-19, and 21. The Examiner is kindly invited to contact the undersigned Applicant's representative by telephone to resolve any outstanding issues and to advance the prosecution of this Application.

Respectfully submitted,



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